TABLE 8-1

GENERAL FORMAT FOR ELECTRONIC LOADING OF LAB FILES

Field ID	Type	Field Description	Required (Y/N)
SITE	CHAR(30)	Contains the site name where the sample was taken. (ex. Landfill 1, Tank 1A)	N
LOCATION	CHAR(30)	Contains the location name where the sample was taken. (ex. MW-01, BH-233)	N
LABNAME	CHAR(30)	Name of the lab doing the sample analysis.	Y
SDG	CHAR(20)	Sample delivery group or lab batch id associated with the sample.	Y
FIELDID	CHAR(50)	Woodward-Clyde chain of custody sample id.	Y
EPASAMPLEID	CHAR(30)	EPA sample id (if applicable).	Y
QAQCTYPE	CHAR(20)	Type of QAQC (blank if none). (ex. matrix spike, matrix spike duplicate, etc.)	Y
MATRIX	CHAR(20)	Matrix of sample.	Y
LABSAMPLEID	CHAR(30)	Lab sample id.	Y
METHOD	CHAR(50)	Analysis method name/number.	Y
SAMPLEDATE	DATE	Date sample was taken.	Y
RECEIVEDATE	DATE	Date the sample was received by the lab.	Y
EXTRACTDATE	DATE	Date the sample was extracted and prepared by the lab (if appropriate).	Y
ANALYSISDATE	DATE	Date the sample was analyzed.	Y
PREPLEVE	CHAR(10)	Preparation level of the sample. (ex. Low, Medium, High)	N
COLORBEFORE	CHAR(10)	Color of the sample before analysis.	N
COLORAFTER	CHAR(10)	Color of the sample after analysis.	N
CLARITYBEFORE	CHAR(10)	Clarity of the sample before analysis.	N
CLARITYAFTER	CHAR(10)	Clarity of the sample after analysis.	N
TEXTURE	CHAR(10)	Texture of the sample.	N

TABLE 8-1
(Concluded)

Field ID	Type	Field Description	Required (Y/N)
PERCENTSOLIDS	NUMBER	Percent solids or percent moisture of the sample.	Y
TEST	CHAR(50)	Internal test name used in the lab (if available).	Y
TESTVERSION	CHAR(10)	Run number of the test or method.	Y
CAS	CHAR(15)	CAS number associated with the chemical analyte (if applicable).	Y
ANALYTE	CHAR(50)	Name of the chemical analyte.	Y
RESULT	NUMBER	Numeric result of the chemical analyte.	Y
ERROR	NUMBER	Error of the chemical analyte (radionuclide only).	Y
UNITS	CHAR(10)	Units of measure.	Y
DILUTION	NUMBER	Dilution used for chemical analyte analysis.	Y
DETECTLIMIT	NUMBER	Detection limit of the chemical analyte (if available).	Y
DLQUALIFIER	CHAR(15)	Detection or report qualifier. (ex. U, ND, J, etc.)	Y
LABQUALIFIER	CHAR(10)	Lab qualifier.	Y
SURROGATE	CHAR(1)	If the chemical analyte is a surrogate (Y/N).	N
COMMENTS	CHAR(240)	Any comments associated with the chemical analyte analysis.	Y

Note: Comma separated value, ASCII file. The value in parentheses is the maximum field length. For optional fields that are not used, comma breaks between fields are still required.

9.0
INTERNAL QUALITY CONTROL CHECKS

Internal Quality Control (QC) procedures are designed to document the overall quality of data. Two types of QC checks (field and laboratory) will be employed to evaluate the data quality. The QC checks represent the controlled samples introduced into the sample analysis stream that are used to validate the data and to calculate the accuracy and precision of the chemical analysis program.

Field QC checks are accomplished by submitting controlled samples that are introduced to the laboratory from the field. Two types of control samples will be used: blanks (trip or field rinsate blanks) and field duplicates. In addition, performance evaluation samples may be used. Any samples submitted as "blind" samples will be noted in the field logbook and given a unique sample number, as specified in FSP SOP No. 1, that does not indicate to the laboratory that the sample is a QC check.

Laboratory QC checks are accomplished through the analysis of initial and continuing calibration checks, blanks (laboratory method blanks), duplicates (laboratory replicates), calibration standards, spikes (surrogate spike, MS/MSD, and system performance checks (laboratory control samples, interference correction samples, etc.).

The level and types of QC check samples that may be introduced into the analysis program for each sampling medium are described below. As a minimum, all of the QC required in the analytical methods will be followed by the laboratory. The samples described may be included in every sample lot. A SDG will consist of no more than 20 samples of the same matrix for all of the organic analyses and inorganic parameters. All QA/QC samples except those submitted "blind" shall be excluded from the count of 20 samples.

For laboratory blanks and other instances in the RIWP in which "Analyte-Free" water is required, the following criteria for "Analyte-Free" reagents (e.g., water, Ottawa sand, solvent) shall be used:

Volatile organics	< PQL
Semivolatile organics	< PQL
Pesticide/PCBs	< PQL
Herbicides	< PQL
Metals and Cyanide	< PQL
PCDDs/PCDFs	< DL

For methylene chloride, acetone, toluene, 2-butone, and phthalates the limit is three times the PQL. See analytical methods for the practical quantitation limit (PQL) requirements for volatile organics, semivolatile organics, pesticide/PCBs and herbicides, metals and cyanide, and the detection limit (DL) requirements for PCDDs/PCDFs. Only the criteria pertinent to the sample analyses being performed need be met (e.g., if only PCDDs/PCDFs are to be analyzed in a sample, then only the PCDD/PCDF criteria need be met). These criteria shall be considered minimum criteria and every effort should be made to obtain reagents with as little contamination as practical.

9.1 FIELD QUALITY CONTROL CHECKS

The type of field QC samples to be collected is shown for sediment sampling in Table 9-1. The frequency of collection of field QC samples is shown in Table 9-2.

9.1.1 Rinsate Blanks

Rinsate blanks are blanks collected by pouring deionized water or solvent, whichever is appropriate to the contaminants of interest, over the sampling equipment after it has

been decontaminated and prior to use in the field. Rinsate blanks are often referred to as equipment blanks or as decontamination procedure blanks. Rinsate blanks are submitted for testing for each type of sampling equipment used each day a decontamination event is carried out (not to exceed one per day). This type of blank should be obtained following sampling at the most contaminated location during field investigation, if known. Rinsate blanks check for sample contamination caused by reuse of decontaminated sampling equipment as well as the sampling process and transportation. Rinsate blanks use analyte-free distilled or deionized water.

9.1.2 Trip Blanks

No trip blanks are required when the sample matrix is soil or sediment.

9.1.3 Performance Evaluation Blank

The performance evaluation blank is a sample of uncontaminated sand or soil identified as a field blank and submitted to the laboratory for analysis. A performance evaluation blank will be supplied by EPA and submitted to the laboratory for analysis of PCDDs/PCDFs at the frequency specified in Table 9-2. If the performance evaluation blank is unavailable from EPA, the laboratory method blank will be substituted and analyzed for PCDDs/PCDFs.

9.1.4 Field Duplicates

Field duplicates are prepared in the field in order to assess the precision of the sampling and analytical procedures. Field duplicates of solid matrices (soils, sediments) are prepared by homogenizing, or mixing, a large portion of a sample and placing equal amounts of a sample into two sets of glassware.

Homogenizing is inappropriate for the analysis of volatile organics. In such cases, two grab samples will be taken from the sampling location. A grab sample is a sample that is taken at one time. For liquids, duplicates are collected by pouring equal amounts of sample into two sets of glassware until they are both filled.

Field duplicates must be submitted blind to the laboratory. The true identity must be thoroughly documented in all field notes. This documentation is not submitted to the laboratory. It is highly recommended that "sensitive" sample locations be selected for the collection of field duplicates. Blind field duplicates should be collected at the frequency specified in Table 9-2. If the results of field duplicates differ dramatically, an analytical problem may exist or the matrix is not homogeneous, and data must be critically assessed.

9.2 LABORATORY QUALITY CONTROL CHECKS

Laboratory QA comes both from strict adherence to the QA/QC measures inherent in the analytical methods run, and from adherence to an overall laboratory QA program. The laboratory QA program should specify that all procedures, both technical and administrative, are documented as SOPs, and disseminated to appropriate laboratory personnel. The QA program also details the mechanisms by which changes are incorporated into SOPs and the means by which revised SOPs reliably replace all superseded copies. The program provides information on the analytical procedures conducted and documents that they were conducted according to sound scientific principles and provides for systematic validation of analytical results. The QA program includes systemic monitoring of laboratory performance so that corrective actions can be taken as needed. The QA program also details the proper procedures for recording and archiving data. It is the responsibility of the laboratory QA Officer and Laboratory Supervisor to implement the QA program and evaluate its performance.

Laboratory QA procedures will be followed to document proper sample handling and tracking of analytical accuracy and precision. Proper sample handling procedures will be documented using logbooks for sample storage and transport as outlined in the laboratory SOPs. Accuracy will be evaluated using analyses of blanks and LCSs and precision will be evaluated using analysis of laboratory duplicates (metals).

9.2.1 Laboratory Method Blanks

Laboratory method blanks are prepared from "Analyte-Free" (as defined above in the introduction to Section 9.0) reagents as demonstrated by laboratory analysis and carried through identical sample preparation and analysis procedures as are other samples. The purpose is to determine if potential sample contamination is arising as an artifact of laboratory procedures. Laboratory method blanks must be analyzed at the frequency specified in the method, but at a minimum of one for each analytical batch of samples.

9.2.2 Laboratory Duplicates

Laboratory duplicates are two portions of a single homogeneous sample which are analyzed for the same parameter in order to determine the precision of the analytical system. The analytical laboratory must perform duplicate analyses on at least one sample in 20 per matrix for the metals and inorganics analyses specified in Table 7-1. The samples on which the laboratory performs the duplicate analysis will be specified on the chain-of-custody analysis request form.

9.2.3 Surrogate Spikes

Surrogate spikes are added to samples to be analyzed for organic contaminants where specified in the analytical method. Surrogate compounds are compounds not expected to be found in environmental samples; however, they are chemically similar to several

compounds analyzed in the method. In the SW-846 method protocols, there are three volatile and six semivolatiles surrogates, which are added at predesignated amounts for the appropriate analyses. Primary and alternate surrogate compounds are recommended for pesticide and herbicide analyses in the respective methods.

A %R for the surrogates is calculated concurrently with the analytes of interest, using the equation in Section 12.1.2.

Since the sample characteristics will affect the %R, the %R is a measure of the accuracy of the analytical method on each individual sample (laboratory QC acceptance criteria for surrogate recoveries are given in the individual methods and as noted in Section 3.0).

9.2.4 Matrix Spikes

MS/MSD sample analyses are used to evaluate the effect of the sample matrix on the accuracy and precision of the laboratory method. Known concentrations of analytes are added to environmental samples; the matrix spike or matrix spike duplicate is then processed through the entire analytical procedure and the recovery of the analytes calculated. Results are expressed as %R of the known amount spiked (and RPD for MS/MSD sample pairs). MS/MSD samples are analyzed for organics (matrix spike only for PCDDs/PCDFs), while a matrix spike and laboratory duplicate sample is analyzed for metals, cyanide, and inorganics. Laboratory QC acceptance criteria for MS/MSD samples are discussed in Section 3.0. The frequency of analysis for volatile and semivolatile organic, pesticide/PCBs, PCDDs/PCDFs, TEPH, and herbicide analyses is shown in Table 9-2.

9.2.5 Laboratory Control Sample

A clean laboratory matrix which is spiked with a known amount of a standard (or standards) is defined as a LCS. The LCS results provide an indication of the accuracy of the laboratory's analysis on standard materials.

9.2.6 Performance Evaluation (PE) Sample

A clean sample matrix which is spiked with a known amount of one or more target compounds and submitted blind to the laboratory to evaluate the accuracy of the laboratory's analysis is defined as a PE sample. For the analysis of PCDDs/PCDFs, EPA will supply PE samples fortified with 2,3,7,8-TCDD and the tetra-through octachloro dioxin and furan. If the PE sample is unavailable from EPA, the laboratory will substitute a LCS containing 2,3,7,8-TCDD and the tetra-through octachloro dioxin and furan. The frequency of analysis is shown on Table 9-2.

9.2.7 PE Interference Fortified Blank

For the PCDDs/PCDFs analyses, EPA will supply PE interference fortified blanks. These samples will be submitted to the laboratory by the sampling team and designated as "for spiking with the appropriate volume of the matrix spiking solution specified in the analytical protocol." If the PE interference fortified blank is unavailable from EPA, then for validation purposes, no PE interference fortified blank will be required. The frequency of analysis is shown on Table 9-2.

9.2.8 Laboratory QA Documentation

All QA/QC procedures followed in the laboratory will be documented through the use of logbooks and system audits. Logbooks will be provided for sample handling,

instrument monitoring and calibration, preparation of standards, and receipt of all chemicals and supplies. All out-of-compliance occasions will be logged by the laboratory QA Officer, with corrective actions described and resolution of the out-of-compliance situation noted as to time, date, and effectiveness. All raw and reduced data necessary to evaluate analytical QA will be stored by the laboratory, in accordance with method SOPs and the laboratory's QA program. All project records will be available for on-site inspection during the course of the investigation. All laboratories will have SOPs in place for all phases of laboratory operations and analytical methods. The SOPs will be provided in the laboratory operating areas and followed by all laboratory personnel. SOPs will be available for on-site review by non-laboratory personnel at any time during the course of the investigation.

9.2.9 Re-Analysis of Samples

If re-analyses, as required by the analytical methodology SOPs, are required with exceptional frequency or in some systematic way, the Contractor QA/QC Officer will be consulted by the laboratory to evaluate more appropriate analytical approaches to problematic samples.